WR #	GSCN Name	Effective Date
WR-22-000172	Section 8 Optimisation	Sept 2022

Associated Work Request (WR) Number:

WR-21-000001, WR-22-000031

Background:

Users of the newly added section 8 have cited issues with understanding and navigating the section.

Existing text in section 8 is not using current terms and lacks adherence to GS1 style guide requirements and best practices that are required to support consistency. This lack of consistency and optimisation makes the document more difficult to read and use.

Before the application standard profiles (ASPs) are expanded, the current ASP framework must be updated.

Disclaimer:

Who should read the General Specifications?

Technical experts working with the GS1 system should read these specifications. They provide a global reference document covering all technical aspects of the GS1 system. Their primary objective is to define the international standard upon which individual GS1 Member Organisations can develop user documentation.

Navigator

These specifications have been developed as a reference document aimed primarily at GS1 Member Organisations (who also produce local language user manuals) and system engineers developing software based upon GS1 system standards. All aspects of the GS1 system are summarised in section 1, which is recommended for those wishing to become familiar with the GS1 system logic and terminology.

Each application section mandates the use of system features defined elsewhere in this document, such as check digits, element strings, data carriers and barcode symbol placement. The sections of these *GS1 General Specifications* are:

- **Section 1 Basics and principles of the GS1 system:** Provides an introduction to the core components of the GS1 system.
- **Section 2 Application standards**: Provides a definition for each GS1 application using a template format. Each application is uniquely identified and contains a description, the associated GS1 key, its definition and links to relevant data structures and attributes (section 3), rules (section 4), carrier specifications (section 5), placement (section 6) and unique processing requirements (section 7).
- **Section 3 GS1 Application Identifier definitions:** Describes the meaning, structure and function of the GS1 element strings so they can be correctly processed in users' application programs.
- **Section 4 Application rules:** Provides the rules for use of GS1 keys in their application environments. Differences in industries are included as well as the data relationship rules for GS1 Application Identifier use.
- **Section 5 Data carriers:** Provides a detailed description of the data carriers that are endorsed by GS1. It includes symbol specification tables for use in the supply chain operational environment as well as the related barcode production and quality assessment required to achieve excellent scan rates.
- **Section 6 Symbol placement guidelines:** Provides guidance on symbol placement as well as transport label standards and tag standards.
- **Section 7 AIDC validation rules:** Provides rules for validating and processing GS1 element strings without human intervention. Check digit and calendar date algorithms are also included.
- **Section 8 Application Standard Profiles** Provides a summary of current application and future state conformance requirements, organised in modular way to make it easier to find the relevant sections.
- **Section 9 GS1 Standards glossary of terms:** A standard vocabulary used throughout the GS1 system.

8 Application Standard Profiles

8.1 Introduction

~~Implementation of GS1 standards is voluntary unless related to a specific regulation. Even so,~~ ~~w~~When a company requires or claims conformance to GS1 standards, it is important to understand ~~exactly~~ what conformance means. The AIDC application standards in section 2 specify the application scope, required identifier, mandatory/optional attributes, data carrier (e.g., EAN/UPC, GS1 DataMatrix) options, data carriers specifications (e.g., print quality, size range) and rules such as GS1 identification key allocation. These and other GS1 standards provide the basis to measure conformance in a consistent way.

For ex~~-~~ample, retailers require suppliers to place an EAN/UPC barcode ~~(~~carrying a GTIN~~)~~ on the consumer package as the retailer requires the GTIN for point-of-sale (POS) and inventory transactions such as orders and invoices. ~~So, t~~The EAN/UPC barcode must also be printed to a minimum quality specification to ensure it can fulfil its purpose. ~~In this way, GS1 standards, agreed on and implemented by industry, provide the basis to measure conformance to trading partner requirements in a consistent way.~~

Note: Implementation of GS1 standards is voluntary unless related to a specific regulation. National, federal or local regulations may take precedence over GS1 standards.

~~AIDC Application Standards Profiles (ASPs) make conformance requirements easier to find and understand. They are organised across applications in a modular way. For example, there are many AIDC application standards in section 2 that relate to fixed measure products scanned at retail point-of-sale, but two ASPs covers them all. The intended audience for ASPs are~~ The Application Standard Profiles (ASPs) ~~those~~ specify~~ing~~ what is conformant for current and, where appropriate, future state implmentations. These ASPs are designed for all stakeholders involved in the implementation process. ~~to be implemented and all involved in ensuring a conformant implementation takes place.~~ This could be a supplier of a consumer product making sure the right identifier, attributes, barcode type and barcode size/quality are implemented on the package or ~~, but it could also be~~ a quality control function assessing the package. It could also be a solution provider who is ensuring their barcode design, printing, verification, or scanning systems accommodate the identifiers, attributes, barcodes and sizes specified by ASPs relevant to the product they are offering. These ASPs provide ways to simplify specifications for hardware and software purchases by referencing conformance requirements for ASPs relevant to the performance of a system.

Beyond documenting current AIDC application standard conformance requirements mentioned above, ASPs provide:

1. **Conformance requirements**: Provides normative reference(s) for conformance requirements, available identifiers, attributes and data carrier choices and quality specifications.
2. **Future state conformance requirements:** Documents future conformance requirements that support migration to an additional data carrier or syntax. These requirements enable a standardised migration to a new capability. For example, the retail sector may determine 2D barcodes could add significant value to an application area, ASP is used to document the conformance requirements for which barcodes will be used for the migration period to support backward compatibility and more. Once specified data carrier or syntax is pervasive enough to be used in an open value chain, the future state conformance requirements will become part of the global application standard.
3. **Cross-application rules:** Provides ~~R~~references to rules that apply across application standards such as multiple barcode management rules, GS1 identification key allocation rules, symbol placement rules and more.
4. **Technical Specifications:** Provides ~~R~~references to technical standards related to the application such as the GS1 Application Identifier list, symbology specifications and more.

~~- Capability to document industry agreements on future conformance requirements so that industry can plan and build a future state that provides greater clarity and interoperability, less divergence and a managed migration until the new capability is pervasive enough to serve as an alternative to the current standard. For example, the retail sector may determine 2D barcodes could add significant value to an application area, GS1 can use an ASP to document their~~

agreement on which 2D barcodes they want, what size/quality is required, rules for the migration period to support backward compatibility and more.

- Potential to simplify specifications for hardware and software purchases by referencing conformance requirements for ASPs relevant to the performance of a system.

ASPs are not organised in a hierarchy nor grouped logically. They are documented in a modular approach per industry priority and listed sequentially as they are approved. This modular approach will permit creates persistent ASP references. For example, ASP referential integrity within vendor requirement documents or system purchase agreements that use reference ASPs to specify requirements will remain relevant independent of future ASP additions.

As a key to understanding the following The ASP tables, detailed descriptions are provided as the following referencesguidance:

- **Basis of cConformance rRequirements:** Each ASP is based on one or more normative AIDC application standards. These are typically found in section 2 of this document but may also be in stand-alone documents. References to normative application standards are the section or documents are recorded provided in each ASP section 8 and within this table.
- **Identifier cChoices**: AIDC application standards contain a required GS1 identification key such as GTIN for trade items, SSCC for logistic units, GLN for physical locations and more. In the case of GTIN, there may be up to four different formats, GTIN-8, GTIN-12, GTIN-13 and GTIN-14. In some cases, all four can be used, but in other cases, only one, two, or three formats are permitted.
- **Mandatory aAttribute(s):** A GS1 identification key is always required and in some applications an attribute is mandatory. For example, variable measure trade items with a GTIN also require an attribute for weight or measure.
- **Optional aAttribute(s):** Section 3.2 provides a list of all GS1 Application Identifiers and data that is defined by GS1 for use in barcodes. All attributes that support the GS1 identification key in use are optional if not listed as mandatory. The party responsible for labelling the object is responsible for determining if optional attributes are needed.
- **Data cCarrier cChoices:** There are various data carriers approved within GS1 AIDC application standard. Each AIDC application standard records which data carriers are conformant. In some cases, there may also be one required data carrier and another that can be used in addition to the first.
- **Barcode size and quality specifications~~Carrier Specifications~~:** Each AIDC application standard that includes a barcode has specifications for size and print quality minimums. Conformity to these specifications and proper placement ensures the barcode has a high likelihood of scanning successfully in the required scan environment.
- **~~Data Format/Syntax (Identifier~~ GS1 syntax~~)~~:** GS1 AIDC data carriers support four different syntaxes. Each syntax defines a structured approach to representing data when it is encoded so that it can be correctly interpreted and processed when it is decoded. Plain syntax has no real structure and is just numeric text. There is also GS1 element string syntax used to encode GS1 Application Identifiers (AIs) and their associated field, EPC URI syntax is used to encode supported AIs within EPC headers and GS1 Digital Link URI syntax that facilitates interoperability with the web.

8.2 ASP 1: Fixed measure trade items scanned at retail POS

ASP 1 applies to product packagestrade items that are intended for scanning at retail point-of-sale, are fixed measure (i.e., not sold on the basis of based on variable weight or variable measure) and are not intended for general distribution scanning. Examples include trade items sold at the retail check-out like such as milk, soup cans, a hat, a lamp, a tennis racket, a battery pack, or a toy. The normative AIDC application standard for ASP 1 is sections 2.1.3.1, 2.1.3.2, or 2.1.3.3 (depending on identifier and symbol choice) for general retail products and 2.1.3.6 for fresh food products.

Note: ASP 1 does not apply to products sold or dispensed in a controlled environment (e.g., pharmacy, hospital) distributed under control via a pharmacy or apothecary based on a physician's

~~prescription~~ nor does it apply to books and serial publications where additional identification, data carrier, specifications and/or rules apply.

~~**Note**: Some trade items like beverage cans bundled by plastic rings may not obscure the barcode on the individual can level as the product may be sold in quantities of one or one grouping (e.g., six-pack). In this case, the barcode on each beverage can require ASP 1 conformance but six-pack transactions, where the individual beverage cans barcode is scanned, may require a check-out quantity confirmation.~~

Figure 8.2.1 ASP 1 conformance requirements

Conformance requirements	General retail products
Basis of conformance requirements	~~GS1 General Specifications S~~section 2.1.3.1 Fixed measure trade items scanned at retail POS using GTIN-12 or GTIN-13 ~~GS1 General Specifications s~~Section 2.1.3.2 Fixed measure trade items scanned at retail POS using GTIN-12 carried by a UPC-E barcode ~~GS1 General Specifications s~~Section 2.1.3.3 Fixed measure trade items scanned at retail POS using GTIN-8 Section 2.1.3.6 Fixed measure fresh food trade items scanned at retail POS
Identifier choices	GTIN-8, GTIN-1~~3~~2, GTIN-1~~3~~2
Mandatory attribute(s)	N/A
Optional attribute(s)	See section 3.2 for the list of GS1 Application Identifiers that may be used with the identifier
Mandatory choices for a d~~D~~ata carrier ~~choices~~	EAN-8, EAN-13, UPC-A, UPC-E, GS1 DataBar Omnidirectional, GS1 DataBar Stacked Omnidirectional, GS1 DataBar Expanded, GS1 DataBar Expanded Stacked
Agreement on conformant data carriers in the future	Any one of the mandatory data carriers or any one of the data carriers below will be conformant in the future once POS system support for these three 2D data carriers below reached pervasive adoption and becomes part of the global application standards. In the migration period, one of the data carriers below may be used in addition to the mandatory data carrier selected. □ GS1 DataMatrix □ Data Matrix (GS1 Digital Link URI) □ QR Code (GS1 Digital Link URI)
~~Carrier~~ Barcode size and quality specifications	Figure 5.12.3.1-1 Symbol specification table 1 contains barcode quality and size specifications for trade items scanned in general retail POS and not general distribution Figure 5.12.3.1-3 Symbol specification table 1 addendum 2 for 2D barcodes ~~symbol specification table 1 in section 5.12.3.1~~
Mandatory choices for GS1 ~~Data format/~~syntax ~~(identifier syntax)~~	Plain, GS1 element string

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Conformance requirements	General retail products
Agreement on conformant syntax in the future	Any one of the mandatory GS1 syntax or GS1 Digital Link URI syntax will be conformant in the future once the POS system support for interoperability between all three GS1 syntaxes has reached pervasive adoption and becomes part of the global application standards. GS1 Digital Link URI

Note: A data carrier with GS1 Digital Link URI to support consumer mobile devices may be used in addition to the mandatory POS data carriers selected.

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Figure 8.2.2 ASP 1 cross-application rules

Cross-application rules	Description	~~GS1 General Specifications~~ Section
GTIN rules	Rules for GTIN mManagement of uniqueness and allocation, and responsibility for allocation.~~, Allocating the numbers, GTIN Management definitions~~	4.3~~, 4.3.7~~
~~**Licensing rules that may impact GTIN allocation**~~	~~Additional requirements in the following sections~~ Rules that apply when a company changes legal status as a result of an acquisition, merger, partial purchase, split, or "spin-off."	1.6
Data relationships	Rules for allowed combinations of element strings on the same physical entity, irrespective of the data carrier(s) applied to the entity.	4.14
Human readable interpretation	Human readable interpretation (HRI) rules ~~are provided~~used to standardise printing requirements and facilitate training of staff on how to deal with GS1 AIDC data carriers that fail to scan or read.	4.15
Multiple barcode management	~~When~~ Rules for implementing multiple ~~additional~~ barcodes on the same trade item.~~are introduced into an existing scanning environment or business application existing barcodes must remain acceptable. This section provides a set of management practices intended to permit the use of multiple barcodes on the same package.~~	4.16
Symbol placement ~~used in POS~~	Rules ~~This section provides guidelines~~ for barcode placement on trade items that will be scanned at pPoint-of-sale.	6.3

Figure 8.2.3 ASP 1 related technical specifications

Related technical specifications	Description	~~GS1 General Specifications~~ Section
GS1 Application Identifiers in numerical order	~~This section~~ Ddescriptions of~~bes~~ the meaning, structure and function of the GS1 system element strings so they can be correctly processed in users' application programmes. An element string is the combination of a GS1 Application Identifier and a GS1 Application Identifier data field. Also see GS1 Application Identifiers browser	3.2

Related technical specifications	Description	~~GS1 General Specifications~~S~~ection~~
Data carrier specifications~~Linear barcodes - EAN/UPC~~	EAN/UPC family technical specifications~~were the first type of barcodes used on a global scale to support the retail check out process.~~	5.2
~~Linear barcodes – GS1 DataBar~~	GS1 DataBar ~~is a~~ family technical specifications~~of linear symbologies used within the GS1 system.~~	5.5
~~Barcode production and quality assessment~~	~~This section has quality specifications and will evolve to meet the changes to data carriers and their use within the GS1 system.~~	~~5.12~~
Check digit calculations	~~This section describes t~~The algorithm used for check digit calculations	7.9
The GS1 subset of International Standard ISO/IEC 646	Lists all characters allowed for use in GS1 Application Identifier (AI) element strings.	7.11

8.3 ASP 2: Fixed measure trade items scanned at retail POS and in general distribution

ASP 2 applies to ~~product packages~~trade items that are intended for scanning at retail point-of-sale and ~~,~~ are fixed measure (i.e., not sold based on variable weight or variable measure). ~~on the basis of weight or measure) but u~~Unlike ASP 1 they are also intended for "general distribution scanning". Examples of these products might be a microwave oven or large bag of animal feed. ~~The normative AIDC application standard for ASP 2 is section 2.1.4.~~

Figure 8.3.1 ASP 2 conformance requirements

Conformance requirements	Fixed Measure POS and General Distribution
Basis of conformance requirements	~~GS1 General Specifications S~~Section 2.1.4 Fixed measure trade items scanned in general distribution and at retail POS
Identifier choices	GTIN-8, GTIN-12~~3~~, GTIN-13~~2~~
Mandatory attribute(s)	N/A
Optional attribute(s)	See section 3.2 for the list of GS1 Application Identifiers that may be used with the identifier
Mandatory choices for a data carrier ~~Data carrier choices~~	EAN-8, EAN-13, UPC-A, ~~or~~ UPC-E, GS1 DataBar Omnidirectional, GS1 DataBar Stacked Omnidirectional, GS1 DataBar Expanded, GS1 DataBar Expanded Stacked
Agreement on conformant data carriers in the future	Any one of the mandatory data carriers or any one of the data carriers below will be conformant in the future once POS and general distribution system support for these three 2D data carriers below reaches pervasive adoption and becomes part of the global application standards. In the migration period, one of the data carriers below may be used in addition to the mandatory data carrier selected. □ GS1 DataMatrix □ Data Matrix (GS1 Digital Link URI) □ QR Code (GS1 Digital Link URI)
~~Carrier~~ Barcode size and quality specifications	Figure 5.12.3.3-1. Symbol specification table 3 Figure 5.12.3.3-2 Symbol specification table 3 addendum 1 for 2D barcodes ~~symbol specification table 3 in section 5.12.3.3~~

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Conformance requirements	Fixed Measure POS and General Distribution
Mandatory choices for GS1 ~~Data format,~~ syntax ~~(identifier syntax)~~	Plain, GS1 element string
Agreement on conformant syntax in the future	Any one of the mandatory GS1 syntax or GS1 Digital Link URI syntax will be conformant in the future once the POS system support for interoperability between all three GS1 syntaxes has reached pervasive adoption and becomes part of the global application standards. GS1 Digital Link URI

Note: A data carrier with GS1 Digital Link URI to support consumer mobile devices may be used in addition to the mandatory POS data carriers selected.

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Figure 8.3.2 ASP 2 cross-application rules

Cross-application rules	Description	~~GS1 General Specifications s~~Section
GTIN rules	Rules for GTIN m~~M~~anagement of uniqueness and allocation, and responsibility for allocation~~, Allocating the numbers, GTIN Management definitions~~.	4.3~~, 4.3.7~~
~~**Licensing Rules that may impact GTIN allocation**~~	~~Additional requirements in the following sections~~Rules that apply when a company changes legal status as a result of an acquisition, merger, partial purchase, split, or "spin-off."	1.6
Data relationships	Rules for allowed combinations of element strings on the same physical entity, irrespective of the data carrier(s) applied to the entity.	4.14
Human readable interpretation	Human readable interpretation (HRI) rules are provided to standardise printing requirements and facilitate training of staff on how to deal with GS1 AIDC data carriers that fail to scan or read.	4.15
Multiple barcode management	Rules for implementing multiple barcodes on the same trade item.~~When additional barcodes are introduced into an existing scanning environment or business application existing barcodes must remain acceptable. This section provides a set of management practices intended to permit the use of multiple barcodes on the same package.~~	4.16
Symbol placement ~~used in POS~~	Rules for barcode placement on trade items that will be scanned at point-of-sale.~~This section provides guidelines for barcode placement on trade items that will be scanned at Point-of-sale and general distribution. General distribution scanning items include any item handled as a single unit in the transport and distribution process.~~	6.3~~, 6.7~~
	Rules for barcode placement on trade items that will be scanned in general distribution environments.	6.7

Figure 8.3.3 ASP 2 related technical specifications

Related technical specifications	Description	~~GS1 General Specifications S~~section
GS1 Application Identifiers in numerical order	This section describes the meaning, structure and function of the GS1 system element strings so they can be correctly processed in users' application programmes. An element string is the combination of a GS1 Application Identifier and a GS1 Application Identifier data field. Also see GS1 Application Identifiers browser	3.2
Data carrier specifications~~Linear barcodes – EAN/UPC~~	EAN/UPC family technical specifications~~Barcodes were the first type of barcodes used on a global scale to support the retail check out process.~~	5.2
~~**Linear barcodes – GS1 DataBar**~~	GS1 DataBar ~~is a~~ family technical specifications~~of linear symbologies used within the GS1 system.~~	5.5
~~**Barcode production and quality assessment**~~	~~This section has quality specifications and will evolve to meet the changes to data carriers and their use within the GS1 system.~~	~~5.12~~

Related technical specifications	Description	~~GS1 General Specifications~~ Section
Check digit calculations	The algorithm used for check digit calculations~~This section describes the algorithm used for check digit calculations~~	7.9
The GS1 subset of International Standard ISO/IEC 646	Lists all characters allowed for use in GS1 Application Identifier (AI) element strings.	7.11

8.4 ASP 3: Variable measure trade items scanned at retail POS

ASP 3 applies to ~~product packages~~trade items that are intended for scanning at retail point-of-sale ~~and identified with a GTIN~~, are variable measure (i.e., are sold based on variable weight or variable ~~on the basis of weight or~~ measure) and are not intended for general distribution scanning. Examples include fruits, vegetables, dairy items, bakery items, meat and poultry sold by weight or measure. ~~The normative AIDC application standard for ASP 3 is GS1 General Specifications section 2.1.12.~~

Figure 8.4.1 ASP 3 conformance requirements

Conformance requirements	Variable measure fresh food using GTIN + count/weight	Variable measure fresh food using restricted circulation number (RCN)
Basis of conformance requirements	~~GS1~~ ~~General Specifications s~~Section 2.1.12.1 Variable measure fresh food trade items scanned at retail POS using GTIN	~~GS1 General Specifications s~~Section 2.1.12.2 Variable measure fresh food trade items scanned at retail POS using RCN
Identifier choices	GTIN-123, GTIN-132	RCN-123, RCN-132
Mandatory attribute(s)	~~Must~~ SHALL have at least one of the following GS1 Application Identifiers: AI(30)/AI(31nn)/AI(32nn)/AI(35nn)/AI(36n)	N/A
Optional attribute(s)	See section 3.2 for the list of GS1 Application Identifiers that may be used with the identifier	N/A
Mandatory choices for a ~~Data~~ data carrier~~ choices~~	GS1 DataBar Expanded, GS1 DataBar Expanded Stacked	EAN-13, UPC-A
Agreement on conformant data carriers in the future	Any one of the mandatory data carriers or any one of the data carriers below will be conformant in the future once POS system support for these three 2D data carriers below reaches pervasive adoption and becomes part of the global application standards. In the migration period, one of the data carriers below may be used in addition to the mandatory data carrier selected. □ GS1 DataMatrix □ Data Matrix (GS1 Digital Link URI) □ QR Code (GS1 Digital Link URI)	N/A

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Conformance requirements	Variable measure fresh food using GTIN + count/weight	Variable measure fresh food using restricted circulation number (RCN)
Barcode size and quality ~~Carrier~~ specifications	Figure 5.12.3.1-1 Symbol specification table 1 contains barcode quality and size specifications for trade items scanned in general retail POS and not general distribution Figure 5.12.3.1-3 Symbol specification table 1 addendum 2 for 2D barcodes ~~symbol specification table 1 in section 5.12.3.1~~	Figure 5.12.3.1-1 Symbol specification table 1 contains barcode quality and size specifications for trade items scanned in general retail POS and not general distribution ~~symbol specification table 1 in section 5.12.3.1~~
Mandatory choices for GS1 ~~Data format/~~syntax ~~(identifier syntax)~~	~~Plain,~~ GS1 element string	Plain
Agreement on conformant syntax in the future	GS1 element string or GS1 Digital Link URI syntax will be conformant in the future once the POS system support for interoperability between these syntaxes has reached pervasive adoption and becomes part of the global application standards.	N/A

Note: A data carrier with GS1 Digital Link URI to support consumer mobile devices may be used in addition to the mandatory POS data carriers selected.

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Figure 8.4.2 ASP 3 cross-application rules

Cross-application rules	Description	~~GS1 General Specifications s~~Section
GTIN rules	Rules for GTIN ~~M~~management of uniqueness and allocation, and responsibility for allocation. ~~Allocating the numbers, GTIN Management definitions~~	4.3
~~**Licensing rules that may impact GTIN allocation**~~	~~Additional requirements in the following sections~~ Rules that apply when a company changes legal status as a result of an acquisition, merger, partial purchase, split, or "spin-off."	1.6
Data relationships	Rules for allowed combinations of element strings on the same physical entity, irrespective of the data carrier(s) applied to the entity.	4.14
Human readable interpretation	Human readable interpretation (HRI) rules are used ~~provided~~ to standardise printing requirements and facilitate training of staff on how to deal with GS1 AIDC data carriers that fail to scan or read.	4.15
Multiple barcode management	Rules for implementing multiple barcodes on the same trade item~~When additional barcodes are introduced into an existing scanning environment or business application existing barcodes must remain acceptable. This section provides a set of management practices intended to permit the use of multiple barcodes on the same package~~.	4.16
Symbol placement ~~used in POS~~	Rules for ~~This section provides guidelines for~~ barcode placement on trade items that will be scanned at point-of-sale.	6.3

Figure 8.4.3 ASP 3 related technical specifications

Related technical specifications	Description	~~GS1 General Specifications s~~Section
GS1 Application Identifiers in numerical order	This section describes the meaning, structure and function of the GS1 system element strings so they can be correctly processed in users' application programmes. An element string is the combination of a GS1 Application Identifier and a GS1 Application Identifier data field. Also see GS1 Application Identifiers browser	3.2
~~**Linear barcodes – EAN/UPC**~~ **Data carrier specifications**	EAN/UPC family technical specifications~~Barcodes were the first type of barcodes used on a global scale to support the retail check out process.~~	5.2
~~**Linear barcodes – GS1 DataBar**~~	GS1 DataBar ~~is a~~ family technical specifications~~of linear symbologies used within the GS1 system.~~	5.5
~~**Barcode production and quality assessment**~~	~~This section has quality specifications and will evolve to meet the changes to data carriers and their use within the GS1 system.~~	~~5.12~~
Check digit calculations	The algorithm ~~This section describes the algorithm~~ used for check digit calculations	7.9
The GS1 subset of International Standard ISO/IEC 646	Lists all characters allowed for use in GS1 Application Identifier (AI) element strings.	7.11

8.5 ASP 4: General ~~R~~retail consumer trade item with extended packaging

Information on a trade item ~~product package~~ can be extended ~~in many ways~~ when the consumer scans a barcode to reach web resources online. For example, a shopper scans a box of packaged pasta to find a selection of recipes. For new extended packaging applications, a web-enabled approach using GS1 Digital Link URI syntax and QR Code or Data Matrix is used. For this reason, the ASP focuses solely on the forward-looking approach. Prior to the GS1 Digital Link URI standard, ~~GS1 approved~~ two approaches were available to reach extended packaging applications that were available within the GS1 system of standards. All legacy implementations of these approaches remain conformant but new implementations SHALL use the GS1 Digital Link URI approach. ~~The normative AIDC application standard for ASP 4 is GS1 General Specifications section 2.1.13.~~

Figure 8.5.1 ASP 4 conformance requirements

Conformance requirements	General retail products GS1 Digital Link URI
Basis of conformance requirements	~~GS1 General Specifications s~~Section 2.1.13.1 ~~for~~ GS1 Digital Link URI syntax for extended packaging applications for trade items
Identifier choices	GTIN-8, GTIN-12~~3~~, GTIN-13~~2~~
Mandatory attribute(s)	N/A
Optional attribute(s)	See section 3.2 for the list of GS1 Application Identifiers that may be used with the identifier
~~**Data** **Mandatory choices for a data carrier** **choices**~~	QR Code (GS1 Digital Link URI ~~only~~), Data Matrix (GS1 Digital Link URI ~~only~~)
~~**Carrier** **Barcode size and quality specifications**~~	Figure 5.12.3.1-3 Symbol specification table 1 addendum 2 for 2D barcodes contains barcode quality and size specifications for 2D barcodes with GS1 Digital Link URI ~~symbol specification table 1 in section 5.12.3.1 addendum 2 for GS1 Digital Link URI~~
Mandatory choices of GS1 ~~Data format/~~ syntax ~~(identifier syntax)~~	GS1 Digital Link URI, see GS1 Digital Link Standard: URI Syntax for more information~~GS1 Digital Link URI (GS1 Digital Link URI standard - https://www.gs1.org/standards/gs1-digital-link)~~

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Figure 8.5.2 ASP 4 cross-application rules

Cross-application rules	Description	~~GS1 General Specifications s~~Section
GTIN rules	Rules for GTIN ~~M~~management of uniqueness and allocation, and responsibility for allocation. ~~Allocating the numbers, GTIN Management definitions~~	4.3~~, 4.3.7~~
~~**Licensing rules that may impact GTIN allocation**~~	~~Additional requirements in the following sections~~Rules that apply when a company changes legal status as a result of an acquisition, merger, partial purchase, split, or "spin-off."	1.6
Data relationships	Rules for allowed combinations of element strings on the same physical entity, irrespective of the data carrier(s) applied to the entity.	4.14
Human readable interpretation	Human readable interpretation (HRI) rules are provided to standardise printing requirements and facilitate training of staff on how to deal with GS1 AIDC data carriers that fail to scan or read.	4.15
Multiple barcode management	~~When additional barcodes are introduced into an existing scanning environment or business application existing barcodes must remain acceptable. This section provides a set of management practices intended to permit the use of multiple barcodes on the same package.~~Rules for implementing multiple barcodes on the same trade item.	4.16

Figure 8.5.3 ASP 4 related technical specifications

Related technical specifications	Description	~~GS1 General Specifications s~~Section
GS1 Application Identifiers in numerical order	This section describes the meaning, structure and function of the GS1 system element strings so they can be correctly processed in users' application programmes. An element string is the combination of a GS1 Application Identifier and a GS1 Application Identifier data field. Also see GS1 Application Identifiers browser	3.2
~~Two-dimensional barcodes – Data Matrix, QR Code~~Data carrier specifications	DataMatrix technical specifications~~The GS1 General Specifications normatively references ISO/IEC standards for Data Matrix (ISO/IEC 16022) and QR Code (ISO/IEC 18004) for the technical aspects of the two-dimensional barcode symbologies. Both symbol types are standalone, two-dimensional matrix symbologies that are made up of square modules arranged within a finder pattern.~~	5.9~~, 5.10~~
	QR Code technical specifications	5.10
~~Barcode production and quality assessment~~	~~This section has quality specifications and will evolve to meet the changes to data carriers and their use within the GS1 system.~~	5.12
Check digit calculations	~~This section describes T~~the algorithm used for check digit calculations	7.9
The GS1 subset of International Standard ISO/IEC 646	Lists all characters allowed for use in GS1 Application Identifier (AI) element strings.	7.11
The GS1 regular expression test	The regular expression test is used to differentiate 2D barcodes encoded with GS1 Digital Link URI syntax and those not encoding GS1 data.~~identify 2D barcodes encoded with GS1 Digital Link URI syntax. This plausibility test is required as we don't have the "FNC1" that identifies GS1 element string syntax~~	See GS1 Digital Link Standard: URI Syntax, section 6~~GS1 Digital Link URI standard, Chapter 6~~
The GS1 ~~L~~link type rules for GS1 Digital Link	Details on ~~L~~link types ~~(short for link relation types) are both human and machine-readable.~~ for use with GS1 Digital Link. Each link type property expresses a distinct kind of information resource found at the target resources URI.~~Link types make it possible to use one data carrier for multiple purposes.~~	GS1 Web Vocabulary for GS1 Digital Link "link type" rules~~GS1 Web vocabulary for GS1 Digital Link "Link type" rules~~